

Appl. No. 09/582,623
Amdt. Dated June 2, 2003
Reply to Office action of March 3, 2003

PATENT AF
RESPONSE UNDER 37 C.F.R. §116
EXPEDITED PROCEDURE
EXAMINING GROUP 3641

Listing of the Claims

17. (Previously amended) A transport device for housing a long length nuclear fuel assembly, said device comprising:

a compartment having substantially the same length as the fuel assembly, said compartment having fixed walls extending in a longitudinal direction and defining an interior space of the compartment, and an opening at a distal end of the compartment in said longitudinal direction;

a fixed structure rigidly attached to one of said fixed walls of the compartment, and comprising at least one fixed guide element extending in a transverse direction transverse to the longitudinal direction of the compartment;

a mobile structure that can be moved in the transverse direction to apply pressure on the fuel assembly, the mobile structure comprising at least one transverse mobile guide element slidably engaging the fixed guide element on the fixed structure,

an adjustable clamping device comprising:

a pneumatic cavity configured to provide a force on the mobile structure in said transverse direction thereby adjusting a clamping force of the mobile structure on the fuel assembly in response to pressure changes in the pneumatic cavity, and

an air inlet control device located at said distal end of said compartment in the longitudinal direction and configured to provide air to said pneumatic cavity to clamp the fuel assembly in a fixed position within the compartment.

18. (Previously added) Device according to claim 17, in which the mobile structure comprises a plane plate parallel to the fuel assembly replacing at least part of the compartment wall.

19. (Previously added) Device according to claim 17, in which the clamping elements are elastic.

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20. (Previously added) Device according to claim 17, in which the guide elements rigidly attached to the fixed structure and the mobile structure slide in each other.
21. (Previously added) Device according to claim 17, in which the fixed structure and the mobile structure are connected together by a return spring.
22. (Previously added) Device according to claim 17, in which the adjustable clamping means comprises:
- at least one clamping element comprising one or several spring leaves separated from each other, of which a free end bears on a plate rigidly attached to the structure that moves in the transverse direction, and the other end is rigidly attached to the fixed structure by means of a hinge pin and its support, and
- an adjustable device comprising one bar for each leaf, rigidly attached by at least one of its ends to a control device comprising an upright parallel to the major axis of the fuel assemblies, which can be moved along this direction and projecting from the accessible end of the compartment, each of said bars being supported on a spring leaf.
23. (Previously added) Device according to claim 22, in which the upright slides inside a section rigidly attached to the fixed structure.
24. (Previously added) Device according to claim 17, in which the adjustable clamping means comprises:
- at least one clamping element comprising a curved spring leaf with an elongated shape, placed longitudinally with a convex surface facing the mobile structure that is free to move in the transverse direction and supported on an adjustment device comprising a roll fixed to the said mobile structure through a support, a control device comprising a support free to slide longitudinally, projecting from the accessible end of the compartment and bearing on the fixed structure, the leaf spring being rigidly attached by one of its ends to said support, the other end

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being free and bearing on said support.

25. (Previously added) Device according to claim 17, in which the adjustable clamping means comprises:

at least one clamping element comprising at least one pair of connecting rods, one being called the "fixed" rod and the other the "mobile" rod, one of their ends being fixed to a sleeve moving in the longitudinal direction, using a hinge, the other end of the "fixed" rod being rigidly attached to the mobile structure by means of a hinge, the other end of the "mobile" rod being rigidly attached to the mobile structure by means of a hinge, the rods being positioned such that they form a V with a variable angle;

a control device rigidly attached to the fixed structure used to activate the sleeve longitudinally starting from the accessible end of the compartment.

26. (Previously added) Device according to claim 25, in which the control device comprises a worm screw that does not move longitudinally and that cooperates with a screw thread formed in the sleeve.

27. (Previously added) Device according to claim 25, in which the transverse guide elements and the adjustable clamping means are combined.

28. (Previously added) Device according to claim 27, in which the combined transverse guide elements and clamping means comprise a device fixed to the connecting rods that cooperates with the control device to impose an angle on the V formed by the connecting rods that depends on the position of the sleeve.

29. (Presently amended) A transport device for housing a long length nuclear fuel assembly, said device comprising:

a compartment having substantially the same length as the fuel assembly, said

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compartment having fixed walls extending in a longitudinal direction and defining an interior space of the compartment, and an opening at a distal end of the compartment in said longitudinal direction;

a fixed structure rigidly attached to one of said fixed walls of the compartment, and comprising at least one fixed guide element extending in a transverse direction transverse to the longitudinal direction of the compartment;

a mobile structure that can be moved in the transverse direction to apply pressure on the fuel assembly, the mobile structure comprising at least one transverse mobile guide element slidably engaging the fixed guide element on the fixed structure,

an adjustable clamping device comprising:

a pneumatic cavity configured to provide a force on the mobile structure in said transverse direction thereby adjusting a clamping force of the mobile structure on the fuel assembly in response to pressure changes in the pneumatic cavity, and

an air inlet control device located at said distal end of said compartment in the longitudinal direction and configured to provide air to said pneumatic cavity to clamp the fuel assembly in a fixed position within the compartment,

wherein the combined guide elements and the adjustable clamping device comprise:

a cylindrical jack body with a transverse axis, rigidly attached to the fixed structure comprising a guide rod in which a compressed air inlet duct has been formed along its axis projecting from its free end, a plurality of cylindrical chambers at its periphery with an axis parallel to the jack axis, each of the chambers containing a compression spring, the springs clamping the mobile structure into the fuel assembly,

a fixed piston rigidly attached to the said free end of the guide rod comprising a seal at its periphery,

a mobile collar rigidly attached to the mobile structure located inside the jack body and adjusted to the shape of said jack body, this collar being inserted between the fixed piston and the jack body and sliding along the guide rod along a corresponding bore formed in said collar, said collar also comprising at its periphery a plurality of housings that nest in an adjusted manner into

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each of the chambers by moving transversely to the longitudinal direction of the fuel assembly,
wherein said air inlet control device comprises a compressed gas supply means opening at an accessible end of the compartment and carrying gas into a pneumatic cavity located between the fixed piston and the mobile collar through the duct.

30. (Previously added) Device according to claim 17, in which the adjustable clamping means comprises a control device opening to the outside of the compartment which controls the cams which bear on the mobile structure.

31. (Previously added) Compartment forming a housing for nuclear fuel assemblies, equipped with at least one immobilization device for transverse immobilization of long nuclear fuel assemblies housed in compartments of the same length with several walls, said device comprising:

a fixed structure rigidly attached to the compartment, located on one of its surfaces and comprising at least one guide element transverse to the longitudinal direction of the assembly,

a structure that can be moved in the transverse direction, capable of applying pressure on a fuel assembly and comprising at least one transverse guide element working in cooperation with the element on the fixed structure,

an adjustable clamping means comprising at least one adjustable clamping element capable of clamping or unclamping the mobile structure on the fuel assembly using an adjustment device and a control device that can be manipulated from the accessible end of the fuel assembly, said control device acting on the clamping element or its adjustment device to fix the assembly in position by reaction on the fixed structure or to release it.

33. (Presently added) Device according to claim 29, in which the mobile structure comprises a plane plate parallel to the fuel assembly replacing at least part of the compartment wall.

34. (Previously added) Device according to claim 29, in which the clamping elements are elastic.

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35. (Previously added) Device according to claim 29, in which the guide elements rigidly attached to the fixed structure and the mobile structure slide in each other.

36. (Previously added) Device according to claim 29, in which the fixed structure and the mobile structure are connected together by a return spring.